

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

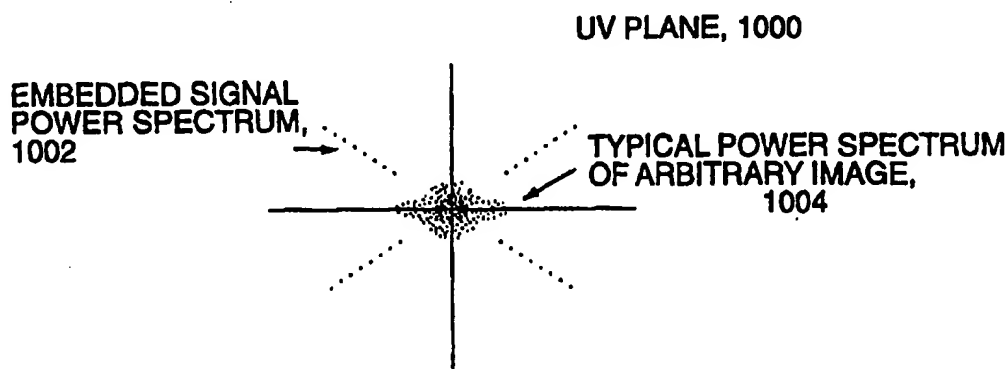
IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problems Mailbox.**

PCTWORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H04N 1/32, 1/00		A3	(11) International Publication Number: WO 96/36163
			(43) International Publication Date: 14 November 1996 (14.11.96)
(21) International Application Number: PCT/US96/06618		(72) Inventor; and	
(22) International Filing Date: 7 May 1996 (07.05.96)		(75) Inventor/Applicant (for US only): RHOADS, Geoffrey, B. [US/US]; 304 S.W. Tualatin Loop, West Linn, OR 97068 (US).	
(30) Priority Data:		(74) Agent: CONWELL, William, Y.; Klarquist, Sparkman, Campbell, Leigh & Winston, One World Trade Center, Suite 1600, 121 S.W. Salmon Street, Portland, OR 97204 (US).	
08/436,102	8 May 1995 (08.05.95)	US	
08/508,083	27 July 1995 (27.07.95)	US	
08/512,993	9 August 1995 (09.08.95)	US	
08/534,005	25 September 1995 (25.09.95)	US	
08/635,531	25 April 1996 (25.04.96)	US	
(60) Parent Applications or Grants		(81) Designated States: AU, CA, FI, JP, US, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).	
(63) Related by Continuation		Published	
US	08/534,005 (CIP)	<i>With international search report.</i>	
Filed on	25 September 1995 (25.09.95)	<i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
US	08/637,531 (CIP)		
Filed on	25 April 1996 (25.04.96)		
(71) Applicant (for all designated States except US): DIGIMARC CORPORATION [US/US]; Suite 213, 10250 S.W. Greenburg Road, Portland, OR 97223 (US).		(88) Date of publication of the international search report: 16 January 1997 (16.01.97)	

(54) Title: **STEGANOGRAPHY SYSTEMS**

**NON-HARMONIC SPATIAL FREQUENCIES ALONG THE
45 DEGREE AXES, GIVING RISE TO A WEAVE-LIKE
CROSS-HATCHING PATTERN IN THE SPATIAL DOMAIN**

(57) Abstract

Various improvements to steganographic systems, and applications therefore, are disclosed. The improvements include facilitating scale and rotation registration for steganographic decoding by use of rotationally symmetric steganographically embedded patterns and subliminal digital graticules; improved techniques for decoding without access to unencoded originals; improving robustness of steganographic coding in motion pictures and/or in the presence of lossy compression/decompression; and representing data by patterned bit cells whose energy in the spatial domain facilitates decoding registration. Applications include enhanced-security financial transactions, counterfeit resistant identification cards, fraud deterrent systems for cellular telephony, covert modem channels in video transmission, photo duplication kiosks with automatic copyright detection, and hotlinked image objects (e.g. with embedded URLs) for use on the internet.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic			SE	Sweden
CG	Congo	KR	Republic of Korea	SG	Singapore
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LR	Liberia	SZ	Swaziland
CS	Czechoslovakia	LT	Lithuania	TD	Chad
CZ	Czech Republic	LU	Luxembourg	TG	Togo
DE	Germany	LV	Latvia	TJ	Tajikistan
DK	Denmark	MC	Monaco	TT	Trinidad and Tobago
EE	Estonia	MD	Republic of Moldova	UA	Ukraine
ES	Spain	MG	Madagascar	UG	Uganda
FI	Finland	ML	Mali	US	United States of America
FR	France	MN	Mongolia	UZ	Uzbekistan
GA	Gabon	MR	Mauritania	VN	Viet Nam

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 96/06618

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04N1/32 H04N1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04N G03G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP,A,0 581 317 (INTERACTIVE HOME SYSTEMS) 2 February 1994 cited in the application see the whole document ---	1,17
A	EP,A,0 551 016 (CANON KK) 14 July 1993 see column 4, line 44 - column 11, line 38 ---	1,17
A	PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON IMAGE PROCESSING (IC, AUSTIN, NOV. 13 - 16, 1994, vol. 2 OF 3, 13 November 1994, INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, pages 86-90, XP000522615 SCHYNDEL VAN R G ET AL: "A DIGITAL WATERMARK" see the whole document ---	1,17,32
-/--		

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- * "A" document defining the general state of the art which is not considered to be of particular relevance
- * "E" earlier document but published on or after the international filing date
- * "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- * "O" document referring to an oral disclosure, use, exhibition or other means
- * "P" document published prior to the international filing date but later than the priority date claimed

- * "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- * "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- * "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- * "&" document member of the same patent family

Date of the actual completion of the international search

21 November 1996

Date of mailing of the international search report

0 5. 12. 96

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+ 31-70) 340-3016

Authorized officer

Hazel, J

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 96/06618

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	RESEARCH DISCLOSURE, no. 358, 1 February 1994, page 75 XP000439803 "AUTHENTICATION AND DISPLAY OF SIGNATURES ON ELECTRONIC DOCUMENTS" see the whole document ---	22
X	EP,A,0 649 074 (XEROX CORP) 19 April 1995	32
Y	see column 5, line 40 - column 13, line 5 ---	33
Y	EP,A,0 605 208 (CANON KK) 6 July 1994 see abstract see page 8, line 12 - line 14 ---	33
A	US,A,3 809 806 (WALKER R ET AL) 7 May 1974 see column 1, line 11 - line 25 -----	32

INTERNATIONAL SEARCH REPORT

Inte. onal application No.

PCT/US 96/06618

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. Claims 1-31: Method of embedding auxiliary data in and recovering them from image data using encoded calibration data
 2. Claims 32,33: Photo-duplication kiosk for detecting copyright data and for interrupting printing
1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
 2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
 3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
 4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 96/06618

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-0581317	02-02-94	CA-A- 2101673 JP-A- 6343128	01-02-94 13-12-94
EP-A-0551016	14-07-93	CA-A- 2086472 JP-A- 5301380 US-A- 5457540	07-07-93 16-11-93 10-10-95
EP-A-0649074	19-04-95	CA-A- 2129075 JP-A- 7175867 US-A- 5444779	19-04-95 14-07-95 22-08-95
EP-A-0605208	06-07-94	JP-A- 6205210 JP-A- 7046400 CA-A- 2112735	22-07-94 14-02-95 02-07-94
US-A-3809806	07-05-74	NONE	